Goddard Space Flight Center

GSFC Matrix Organization -Guidelines and Best Practices

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DEFINITIONS

Terms Defined for this Document

A functional organization/home organization is defined as any organizational unit that is chartered to provide and maintain specific skills and personnel needed to support Goddard's missions by performing assigned functions. These functions and skills include discipline areas of science, engineering, management, finance, etc.

A project management organization is an organization, office, or group that manages missions, programs, projects, proposals, research, and other work activities in support of Goddard's objectives. Project management organizations require experts from Goddard's functional organizations to achieve their mission or goals.

A matrixed employee is an individual with skills residing in a functional organization and having assignments that support a project management organization or office. A matrixed employee can be an engineer assigned to a mission, program, project, instrument, proposal, research Principal Investigator, or serve under a lead engineer. He or she can be a scientist in one science branch assigned to another science branch, mission, program, project, instrument, etc. A matrixed employee may or may not be co-located with the project that he/she supports.

A supervisor of a matrixed employee is the administrative supervisor of the matrixed employee that is responsible for performance evaluations, performance plans, assigning work, etc. and is considered the manager of a functional/home organization.

A Matrix organization in the context of this document consists of projects/missions and functional organizations. The projects/missions are organizations that do not maintain needed skills and expertise within the organization itself. Functional organizations supply the needed skills and expertise. Missions, programs, projects, etc. request support from functional organizations to achieve their goals as stated in their task descriptions or requirements. GSFC is considered the matrix organization, with Code 400 being the project organization, and the other directorates being the functional (engineering, human resources, etc.) organizations.

1.0 Introduction - What is the GSFC matrix organization, how does it work?

The purpose of this document is to provide Goddard Space Flight Center (GSFC) employees and organizations with a set of guidelines and best practices that facilitate the operation of the GSFC matrix organization.

The scope of the document is limited to that of helpful guidelines rather than levied requirements. It recommends best practices in implementing the matrix organization, but does not supplant other documents defining NASA or GSFC policy or regulations.

The document is intended for employees who are employed in the matrix organization at the GSFC. This includes the users of the products and services (e.g., project management), the supporting organizations supplying the products and services (e.g., the Applied Engineering and Technology Directorate), and the employees who are matrixed from one organization to another.

A number of large organizations, both industry and government, are structured in a form called a matrix organization. This organizational structure can be very effective and efficient when the parent organization is engaged in developing many projects simultaneously, as does the GSFC.

A project is established for developing a particular end product, e.g., a space flight mission. It has a definite cycle and a finite lifetime, i.e., a beginning, middle, and an end. If the product requires substantial technical development then it will require considerable technical (e.g., engineering) support. Because a project must be funded, and must track progress against a schedule, it also requires support in the resources area. A typical, complex project, therefore, will require a great deal of engineering and administrative support, but only for a finite period. Ideally, a project manager would like to have this support available to him/her at all times so the project technical, cost, and schedule goals can be met. If an organization is managing a number of projects simultaneously, however, it is a major burden and expense to staff each project with an exclusive set of technical experts. Moreover, it is unlikely that all of these resources are required on the project 100% of the time. Additionally, when a project is complete, the entire team (or a large portion thereof) would have to be reassigned or let go, which would be a major waste of resources. There is also a risk that a project with its own, exclusive staff, without frequent contact with an external technical overseer, could overlook issues that might threaten mission success. Frequent contact with an external technical overseer is healthy for project success.

The most common and effective approach to meeting the needs of the organization described above is to establish what is known as a matrix organization. In this type of organization, there is a project management organization, for example, the Flight Programs and Projects Directorate (FPPD) at GSFC, which is responsible for the implementation of GSFC projects. Each project is staffed with a core group of employees from the FPPD including the project manager, deputy project manager, etc., who are responsible for managing the project. Typically, GSFC has a mixture of in-house and out-of-house projects. The latter are considered out-of-house because these projects usually award contracts to major aerospace contractors for the spacecraft and/or instruments. The project management function is the same in both cases.

The parent organization, i.e., GSFC, also has one or more functional organizations. These organizations perform a number of functions that further the Center's goals such as space and Earth science, technology development, and project support. They also provide institutional support such as financial management.

Another important aspect of a matrix organization is the ability to increase or decrease staffing levels in a short period. A matrix organization can bring to bear extensive expertise (depth and breadth) to solve technical and/or administrative problems that may arise, and then return to a staffing level commensurate with a project's baseline once solved. This surge in staffing levels can be accomplished more efficiently in a matrix organization than a non-matrix organization.

The focus of this handbook is to provide a set of guidelines for employees of the functional organizations, such as the Management Operations Directorate (MOD), Code 200, the Office of Systems Safety and Mission Assurance (OSSMA), Code 300, and the Applied Engineering and Technology Directorate (AETD), Code 500, which supply support to projects in the FPPD (Code 400), the Suborbital and Special Orbital Projects (Code 800) and to the Sciences and Exploration Directorate (Code 600). The functional organizations often supply support to science organizations at GSFC in the building of flight instruments, technology development, and science data processing and analysis systems. They supply the functional expertise to all projects in a shared manner so that each project does not have to maintain a large technical staff of its own.

The matrix organization is best described by the matrix that gives it its name (See Table 1 below).

Project Supporting Organizations (Functional)/ 200, 300, 500	Typical Support Functions		Project/Science Organization (Code 400/600)			
			Project A	**Project B**	**Project C**	**Project n**
			Functional Responsibility			
	Electrical Eng.	**Project Responsibility**				
	Systems Eng.		Systems Eng. support from Code 500 for Project A		Systems Eng. support from Code 500 for Project C	
	Software Eng.			Software Eng. support from Code 500 for Project B		
	Safety Eng.					
	Thermal Eng.					
	Procurement		Procurement support from Code 200 for Project A			
	Resource Anal.					
	Mechanical Eng.		Mechanical Eng. support from Code 500 for Project A		Mechanical Eng. support from Code 500 for Project C	
	Etc.					

Table 1. GSFC Matrix Organization

Table 1 shows that each project has total responsibility for managing all aspects of the project, represented in the columns. The functional organizations are shown as providing functional support to the projects, shown in the rows. For example, AETD, Code 500, is shown as supplying the systems engineer and mechanical engineer for Projects A and C, and the MOD, Code 200, is shown as supplying procurement support to Project A. In many cases, the support from a functional organization will mean a person is assigned full-time or almost full-time to the

project. In these cases, the person may be co-located with the project. In other cases, one person might support many projects and will not necessarily be co-located with any project, but will remain located with the home organization. In all cases, the home organization will support the project in that function by one or more persons or by using contractor support. In this manner, the projects request, and receive, all support needed without having to staff every single position under the project organization. The functional organizations are able to supply the support to the projects as needed, and supply additional support (sometimes contractor support) to any project on an as-needed basis. If necessary, the functional organization should develop the statement of work and task description to acquire contractor support.

In this handbook, the term "matrixed employee" is an employee who is a member of a functional organization that is assigned to support a project. The matrixed employee may be co-located either with the project or work for the project from his/her home organization. The home organization is also known as the functional organization and is the employer of the matrixed employee. Generally, a project will be the organization that is assumed to be supported. There are cases, however, where a parent organization co-locates employees to organizations other than projects. One example is the co-location of Resource Analysts from Code 501 to Divisions within the AETD. The same principles of matrix organization management apply.

The remainder of this handbook will discuss in more detail the roles and responsibilities of all the parties involved (Section 2.0) and some guidelines and best practices for implementing the matrix (Section 3.0). It is meant to be a handbook for guidance rather than a specification, so the word "shall" is not used. Summaries of guidelines in the form of a "General Rule" are found at the end of each section.

2.0 Roles and Responsibilities

For a matrix organization to work effectively, it is necessary that all parties involved know and understand how it functions, and their respective roles and responsibilities. Additionally, work and business practices that are consistently applied across GSFC projects will help matrixed employees transition from one project to another. This section will outline the roles and responsibilities of the home organization (i.e. the organization from which employees are matrixed), the matrixed employee, and the project organization.

2.1 Home Organization and Supervisor

To support the successful completion of project work, the home organization is responsible for providing (to the project) the needed technical skills, resources and capabilities. This means assigning qualified employees, and other relevant resources, to the project. These employees are known as matrixed employees, and may be assigned to a project full or part-time. However, it can also mean the assignment of one person to support several different projects. He or she would then work part-time on these respective projects. If the project provides office space for this employee, that person is known as a co-located matrixed employee. This person would still be a matrixed employee even if he or she is not co-located with a particular project.

The home organization is usually, but not always, at the branch level within the functional organization. The assignment of matrixed employees is not arbitrary, i.e., the assigned employee's skills are matched to the project's need. This means that there is often the need for discussion between the project manager (or subsystem lead) and the Branch Head. Commensurate with the responsibility to support the project, the branch may have to supply additional support (contractor or civil servant) or backup support to satisfy the project's needs.

In addition to the support provided by the matrixed employee, the branch may need to supply periodic support to the project. This could involve support for a peer review, a problem-solving tiger team, mishap investigations, Source Evaluation Boards, or an independent review team. This is consistent with the branch's responsibility to support the project for the Center.

In many cases, the support requested may result in an experienced engineer from a branch serving as a subsystem lead, instrument manager, or proposal manager. In these cases, the matrixed employee has management responsibilities (he/she may lead a team or group), as well as technical responsibilities to the project.

There are cases where a branch (Branch A) does not have enough qualified civil servants to fulfill its obligations to the projects. In this case, civil servants from another branch (Branch B) can be detailed into this branch (Branch A) to fulfill the functions of the branch (Branch A). If the branch is unable to find an available, qualified civil servant employee, or fill the position via a detail, it will be necessary to employ a support service contractor. However, civil servants must fill job functions that are inherently governmental. The project provides funds to the branch for establishing a contractor support task. The branch is still responsible for finding the appropriate qualified person. The project and branch work together until a satisfactory solution is achieved.

Because of changing project needs, and because of the changes in the branch staff and skill level, it is necessary for the branch head to stay current with project needs, resolve staffing conflicts, and plan ahead for staffing and skill changes. The branch has a responsibility to make every effort to meet their commitments to the project, and minimize disruptions to the project by reassigning personnel. It should be clear that the branch provides discipline expertise, products and services to a project. The branch is responsible for the technical quality of the product and/or service provided from that branch to the project. This includes, but is not limited to, hardware and software systems, technical consultation, back-up support for the matrixed employee, special analyses, lab and test support, project and peer review support, etc.

2.2 Project Organization and Project Manager

The project organization and the project manager also have roles and responsibilities they must fulfill if the matrix organization is to function successfully.

The project organization must provide clear requirements or needs to the branches in a timely manner. These needs should be expressed in technical and/or management (e.g., if a subsystem lead is involved) terms, and not expressed in terms of individual names. The branch has the

responsibility to meet the need, but not necessarily by assigning a particular individual. A face-to-face discussion between the project and the branch is highly desirable during this process.

The matrixed employee frequently spends most of his/her time with the project. He or she often represents the project to the customer, Principal Investigator, or contractor organization. It is important, therefore, that the matrixed employee be accepted, integrated into the project team, and empowered to represent the project. Thus, the project has a responsibility to the matrixed employee for mentoring, funding project-related training, and prompt and documented feedback on performance to both him/her and to the home organization supervisor. The feedback should be for both good and/or poor performance, should include suggestions on how to improve and grow technically, and should be more frequent than once per year for the required performance appraisal.

Project management also needs to provide feedback to the branch on project status so that the branch head is informed of project needs related to staffing changes, extra support for reviews, problem solving, etc. A regular and accurate dialog should exist between the matrixed employee and supervisor on the status of the matrixed employee's support to the project. The project manager should also encourage the matrixed employee to maintain close contact with his/her home organization to maintain open communications and to communicate project status/progress to the home organization.

The project should have an open work environment so that, if necessary, the matrixed employee can express or raise concerns about technical quality or safety. These concerns should be raised to the project manager and branch head when he/she thinks that mission success might be at risk because of a particular decision made by the project (see Section 3.8 for additional guidance).

2.3 Matrixed Employee

Matrixed employees have roles and responsibilities that must be fulfilled for GSFC to work effectively. This can sometimes be a difficult role because he/she essentially has two supervisors and/or multiple chains of command[1]. It is essential that the branch head reconcile direction given to the matrixed employee by the home organization that may contradict direction he/she receives from the project.

There are specific roles and responsibilities the matrixed employee has to the project, and complementary ones to the home organization. The matrixed employee provides expert technical and engineering advice to the project that is essential to project development and success. In this sense, he/she is fully part of the project team. In addition to this support, an experienced matrixed employee will often be tasked to be a subsystem lead. In this capacity, he/she also provides management support to the project.

The matrixed employee's administrative and technical base is still the home organization and he/she has responsibilities to that organization. He/she needs to keep the home organization

[1] The only true supervisor is the one from the home organization. However, the project manager does provide technical supervision for the project work.

informed on all aspects of the work being performed for the project. The home organization must be kept up to date on the progress of the project, and should be informed in advance if the project will need additional support, for a review, for example. The matrixed employee should also inform the home organization if the project is making technical decisions that he/she considers risky for mission success or mission safety (more on this later). In addition to issues of technical quality and mission safety, the home organization should be promptly informed of matrixed employee workload issues (too much or too little), whether or not he/she requires training to fulfill project responsibilities, and in general, any personnel issues that the home organization should be made aware. The matrixed employee should inform the home organization if the assigned work cannot be completed within the committed resources, and according to the defined schedule.

The matrixed employee's responsibility to both the project and to the home organization is to communicate a consistent message to both. This includes technical, employee, and management related issues. There should be no surprises (technical or personnel-related) for either the project or the home organization. If, however, an employee perceives that he/she will experience retribution for asserting a message regarding technical concerns, safety, or security, the employee should consult with their home organization supervisor before communicating with project management.

As for any NASA employee, the matrixed employee must keep mission safety and mission success as top priorities and report any concerns to the project manager and to the home organization. If the issue needs to be raised to higher levels of management, the home organization supervisor should help the employee raise these issues through the home Division and Directorate.

3.0 Guidelines and Best Practices

The following paragraphs will outline some specific guidelines and best practices that facilitate the operations of the GSFC matrix organization and make it more understandable to both matrixed and non-matrixed employees. If followed, matrixed employees (and project managers) can expect work and business processes to be practiced consistently across all GSFC projects that he/she supports.

3.1 Administrative Support

The administrative support supplied to employees located within their home organization is usually taken for granted, however, the support for a matrixed employee is often not obvious. Alternatives discussed below address administrative issues such as office space for co-located employees and access to computer equipment.

3.1.1 Location

If a matrixed employee is working primarily (more than 50%) for one project, it may be in the best interest of both the project and employee that he/she be co-located with the project. This is

not a hard rule since co-location of a matrixed employee should be discussed between the home organization and the project. There are many factors to consider. For example, does the matrixed employee lead a large group of matrixed employees who are located at the home organization? Are there tools and equipment located at the home organization that are critical to accomplishing the work assigned to these employees?

Co-location depends on the type of work the employee is performing. If the work performed is, for example, building or testing hardware in a home organization lab, co-location might not be appropriate. If the matrixed employee is working for many projects and spends only 10 or 20% of his/her time on any one project then he/she should be located with the home organization. Often the project will have difficulty finding space for co-located people. However, space will be found for key matrixed employees (e.g., subsystem lead or team lead) on the project because project management believes that it is important to have the critical elements together to foster teamwork and communication.

GENERAL RULE: Co-locate the matrixed employees with the project when feasible. If a matrixed employee is on a project more than 50% of his/her time, and/or is a subsystem lead, it may be better for that person to be co-located with the project. Co-location also depends, however, on the type of work the person is doing. If, for example, a group of matrixed employees who are building or testing hardware in a home organization lab, co-location with a project may not be appropriate.

3.1.2 Equipment and Services Support

Equipment (e.g., office equipment, computers, etc.) and services (e.g., secretarial and Information Technology (IT)) support should be provided by the organization with which the matrixed employee is located. If the matrixed employee supports multiple projects, the home organization generally supplies the computer. This is often a laptop that the employee moves with him/her as he/she supports projects. If a project requires the matrix employee to use specific software applications or hardware, the project should provide it to the matrixed employee.

The organization that supplies the computer should be responsible for its maintenance. The sharing of computer support and computer maintenance costs can be negotiated (and has been in the past) between the project and the support organizations (such as Code 500). It is important that the matrixed employee understand any agreements that are in place between the project and the home organization that address computer support and maintenance. This includes understanding which organization provides general office supplies, access to a printer and printer supplies.

GENERAL RULE: Computer support is provided by the local organization, i.e., where he/she sits. If the matrixed employee supports multiple projects, the home organization generally provides the computer. It is important that the matrixed employee understand any agreements that are in place between the project and the home organization that address computer support and maintenance.

3.2 Travel, Training, and Document Review Support

In addition to administrative support, such as supplying computers and secretarial support, travel and training support are necessary for the matrixed employee to do his or her job.

3.2.1 Travel

If a matrixed employee travels on project business, the project pays for that travel. If an employee travels on non-project business, e.g., career development, technical conference, etc., the home organization pays for that travel. The project can, however, volunteer to fund a matrixed employee's travel to a conference. Regardless, both organizations bear the responsibility of ensuring that government travel funds are used wisely, particularly for conferences. The administrative paperwork for project travel, orders and vouchers, should also be done by the project. However, because the administrative support within a project might be insufficient to handle all orders and vouchers (projects often require a great deal of travel), the project might request that the home organization submit orders/vouchers. This should be negotiated between the project and home organization. For home organization travel, the home organization should handle all travel orders and vouchers. Employee time expended on non-project related travel should be charged to the projects he/she supports whenever possible, and with project approval; if not possible, the matrixed employee should discuss alternative funding sources with his/her supervisor before submitting travel orders.

GENERAL RULE: Project related travel is paid by the project. The home organization funds travel to technical conferences, and non-project related training. Projects can volunteer to fund matrixed employee travel to technical conferences. Regardless, both organizations bear the responsibility of ensuring that government travel funds are used wisely. Employee time expended on non-project related travel is charged to projects whenever possible (with project approval); if not possible, the matrixed employee should discuss alternative funding sources with his/her supervisor before submitting travel orders. Travel orders and vouchers should be handled by the organization funding the travel.

3.2.2 Training

The home organization is responsible for maintaining the matrixed employee's skills and fund training for this purpose. If project-specific training is required, the project should fund that training. For example, this could include foreign language training for matrixed employees on an international project. Mandatory Center or Agency training are handled for all employees, matrixed or non-matrixed, in the same manner. Matrixed employee time for attending skill development courses (not project-related), is charged to the training account/WBS. Matrixed employee time for attending or taking mandatory IT Security training and other NASA-required training is charged against the project or projects that the matrixed employee supports. The home organization generally pays (if approved by management) for memberships in professional organizations; however, projects may offer to fund this expense.

GENERAL RULE: Project-related training is funded by the project. Training for skill and career development is funded by the home organization. Matrixed employee time for attending mandatory IT Security training and other NASA-required training is charged against a project

or projects that the matrixed employee supports. Matrixed employee time for attending skill development courses (not project-related), is charged to the training account/WBS. The home organization generally pays (if approved by management) for memberships in professional organizations, however, projects may offer to fund this expense.

3.2.3 Technical Papers/Proposal Review and Approval

Project personnel (both matrixed and non-matrixed employees) who author technical papers must follow NASA information disclosure policies before publishing or presenting them at technical conferences. If a matrixed employee is the primary author of a technical paper, he/she should route the technical paper through his/her home organization for review and approval. If a matrixed employee in not the primary author, and the primary author is a Goddard employee, the technical paper is routed through the primary author's organization for review and approval. If the primary author is not a GSFC employee, the matrixed employee should route the technical paper through his/her home organization for review and approval. Technical papers focusing on a specific GSFC project (or projects), should be routed through the appropriate project manager(s) or designee(s) for concurrence. The matrixed employee is responsible for complying with their home organization's and NASA's policy on information disclosure, document review and approval.

When developing proposals, if the matrixed employee is the Principal Investigator or Co-Investigator, the proposal should be routed through his/her home organization for review and approval. The matrixed employee is responsible for complying with their home organization's policy on proposal review and approval.

GENERAL RULE: A matrixed employee who is the primary author of a technical paper should route the technical paper through his/her home organization for review and approval. If the primary author is not a GSFC employee, the matrixed employee should route the technical paper through his/her home organization for review and approval. Technical papers focusing on a specific GSFC project (or projects), should be routed through the appropriate project manager(s) or designee(s) for concurrence. A matrixed employee who is the Principal Investigator or Co-Investigator on a proposal should have his/her home organization review and approve the proposal. The matrixed employee is responsible for complying with their home organization's and NASA's policies on information disclosure, and document and proposal review and approval.

3.3 Career Development

The employee, whether matrixed or not, is ultimately responsible for managing his or her own career; however, the employing organizations have responsibilities in supporting matrixed employee career development goals. Career development includes not only training but assignments, details, mentoring, on-the-job training, etc.

The home organization has the responsibility to provide a capable workforce and, therefore, has the primary responsibility to provide career development opportunities for the matrixed employee. This could include training courses, reassignments, and/or temporary details away

from the project. This also includes the primary responsibility for active mentoring of the matrixed employee.

If a person works full-time, or almost full-time on a project, that project also has some responsibility for the matrixed employee's career development. This could include cooperation with the home organization when they want to reassign or detail a matrixed employee for career development purposes. Because the project continues to need support, and the home organization is still responsible for the support, the replacement or temporary backfill of a matrixed employee should be coordinated between the project and the home organization well in advance. There may be times when the project is in a critical phase and the detail or reassignment may have to be postponed. The project must also acknowledge that they will lose some individuals to a detail or reassignment and they will need to work with the home organization to assure continuity of support. The key for success here is clear and on-going communication between the home organization and the project.

The home organization, usually a branch, needs to be proactive in this area, looking ahead to broaden the matrixed employee's experience level. If this is not done, the matrixed employee could stagnate or be overlooked on a project resulting in poor morale and unfulfilled career growth. Poor morale is an issue that should be resolved by the individual and both organizations as quickly as possible.

Sometimes a matrixed employee will remain on a long-term project for several years. Even if this is acceptable to both the project and the employee, the employee should be rotated out of the project periodically for training details. This will further strengthen the matrixed employee's skills, and benefit the other projects to which he/she is detailed because of the experience he/she brings. If a matrixed employee is full time, or almost full time, on a project, the project also has a responsibility to provide both on-the-job training and mentoring through someone on the project team.

GENERAL RULE: Communication between the home organization and the project is critical for establishing temporary details/assignments as career development activities for the matrixed employee. Both the project and the home organization must be proactive and flexible in establishing a career development activity, keeping in mind the benefits of career development for matrixed employees. Rotation out of a long-term project for training details should be planned for matrixed employees on these projects. The project is responsible for providing both on-the-job training and mentoring to matrixed employees that are assigned full time, or almost full time to the project.

3.4 Communication and Information Sharing

Communication and information sharing are probably two of the most difficult gaps to bridge in a matrix organization. This is because many employees who are matrixed are co-located with the projects that they are supporting and are physically distant from the home organization. Thus, the communication that would naturally happen with colleagues in the home organization, if all were located together, does not occur. The day-to-day conversations instead take place with the

matrixed employee's colleagues on the project. A conscious effort must be made by all parties to ensure regular communication between a co-located matrixed employee and the home organization. Lack of appropriate communication between the employee and the home organization is probably the single most important reason that some of the co-located matrixed employees feel isolated or neglected by the home organization, and/or feel that the recognition or appreciation of their work is missing. The difficulty in establishing a strong communication link in this area is the time factor. It is difficult for the co-located matrixed employee to find the time to talk to the appropriate stakeholders, even someone as important as the home supervisor. Following are some guidelines and best practices recommended to help establish and maintain a strong communication link in this area.

The co-located matrixed employee should be communicating on a regular basis with the home supervisor. Both parties are responsible for ensuring this happens. The regular basis should be at least biweekly. The required communication frequency for the mid-term and performance appraisal is insufficient.

Although it should be frequent, another salient feature of this communication is that it should not be an administrative burden to either party; therefore, the majority of this communication should be informal. Technical progress on a project can be conveyed to the home supervisor in any number of ways, for example, forwarding the project weekly report with some comments if necessary. Most home organizations also hold technical status reviews where the employee will discuss work status and progress with branch management. The home supervisor must also be apprised frequently of status on such issues as the co-located matrixed employee workload, extended leave, etc., that might affect the support that the home organization is providing to the project.

A recommended approach is management-by-walking-around (MBWA) by the home organization supervisor. For this approach, the supervisor visits co-located matrixed employees at their locations for brief (15 minutes) face-to-face biweekly meetings. This would not burden the co-located matrixed employee and would provide essential face-to-face contact. Granted that for a supervisor with a large span of control this could take several hours; however, ensuring the appropriate communication necessary to facilitate the operations of the matrix organization is a major responsibility of that supervisory position. An alternative approach would be to have the home organization supervisor set aside a few hours per week when the matrixed employees would visit for short face-to-face meetings. This is not as desirable as the supervisor "walking around". Having the home organization supervisor allocate time to receive the matrixed employees requires all the co-located matrixed employees to visit the supervisor. This is much easier to ignore, and is much less effective than if the supervisor does the visiting; however, an agreement between the matrixed employee and his/her supervisor, that includes meeting in the supervisor's office, would meet the intent of the guideline as long as the recommended frequency (biweekly) was maintained.

Regular communication between the home supervisor and the co-located matrixed employee is important for many reasons. The employee is no longer a stranger to the home organization. He or she can be kept up to date on career opportunities, technical issues faced by other projects that might help him/her, etc. The home organization supervisor is kept up to date on projects, is better

able to assess project needs, and has a more current assessment of the co-located matrixed employee's strengths and weaknesses, training needs, etc. The latter information can easily be missed if contact is only every six months at performance reviews. The project should also have a strong interest in this type of communication because it is beneficial to the project.

Additionally, it is suggested that the functional organizations hold monthly branch staff meetings or "Brown-Bag" luncheons so that employees can share project status, project needs, technology development news, or other topics among themselves. Functional/home organizations should hold monthly technical status reviews where all matrixed employees on a given project present status and progress. It is also suggested that home organization supervisors make an effort to attend project reviews at which the matrixed employee presents, especially the major ones such as Preliminary and Critical Design Reviews.

Communication between the project and the home organization regarding matrixed employee performance is also important. It is important that the communication method used minimize the administrative burden on both parties. The minimum required contact between the project and the home organization is two times per year for the performance plan/appraisal. The recommended contact is a once-per-quarter via an informal, brief contact by phone or e-mail, initiated by the supervisor. This aids the memory process when documenting performance appraisal details for both parties. If an issue arises, however, either employee-related or technical, it is necessary to communicate promptly, as often and as long as necessary to resolve the problem. Communication between the project and the functional organization will generally need to be more frequent for in-house projects. This should be done at whatever level both organizations believe is necessary to function in that environment. The primary focus of branch-project communication is to ensure high customer satisfaction, high employee morale, and that the quality of the technical work performed by the matrixed employee or the product produced by the functional organization meets or exceeds customer expectations. Additionally, it is vital to communicate and document matrixed employee performance or conduct issues promptly.

GENERAL RULE: The home organization supervisor should stay in contact with co-located matrixed employees bi-weekly. Ensure that communication status to the home organization is not a burden for the matrixed employee. Branches should hold informal monthly meetings to allow matrixed employees to share information and to maintain branch cohesion. The functional organization should communicate with the project they support once per quarter. The primary focus of branch-project communication is to ensure high customer satisfaction, high employee morale, and that the quality of the technical work performed by the matrixed employee or the product produced by the functional organization meets or exceeds customer expectations. Employee performance or conduct problems must be documented and dealt with promptly.

3.5 Customer Interfaces and Customer Satisfaction

The matrixed employee assigned to a project is seen by the project as a project representative. In this role, the matrixed employee talks directly to the customer (e.g., science team) and/or the prime contractor for the project. There may be times when there is a sensitive interface between the project and the customer or contractor, e.g., international issues. In this case, the project manager might establish a single point of contact on the project through which all project personnel communicate to the customer. The project organization should communicate this point of contact to all project personnel.

The matrixed employee is not to direct the contractor. This direction is the responsibility of the Contracting Officer (CO) or Contract Officer's Technical Representative (COTR). This restriction applies whether the employee is matrixed or not. The matrixed employee may provide direction to a support service contractor on a task for which the matrixed employee is the government representative for the task or on a contract when they serve as the COTR. The home organization is responsible for ensuring that the matrixed employee is knowledgeable about the rules and regulations related to contracts and contractor direction.

If a civil servant experiences performance issues or concerns with a contractor employee, then those concerns should be communicated to the Task Monitor or to the COTR. Only the COTR is authorized to direct the contractor.

GENERAL RULE: The matrixed employee and home supervisor should understand the projects position/procedures for communicating to external customers. Once established and understood, the matrixed employee must be proactive in following these procedures. Direction of contractors must be through the COTR. The home organization is responsible for ensuring that the matrixed employee is knowledgeable about the rules and regulations related to contracts and contractor direction.

3.6 Managing Employee Performance

All three entities, the home organization, the project, and the matrixed employee have responsibilities in this area.

The home organization is responsible for initiating the process and collecting performance appraisal information from the project. The home organization supervisor is required to contact the matrixed employee's customer, e.g., project, for performance feedback. As a minimum, this should be done at least twice per year, at mid-term and for the annual performance appraisal. As discussed previously, it is recommended that this be a more frequent process including at least quarterly contacts between the home organization and the project. An informal process can be used. For example, at the quarterly contacts, an e-mail can be supplied to the home supervisor who adds it to the employee's file. An email will provide current information, and would aid the memory of the home organization supervisor for the performance appraisal process. The description above is a recommended general guideline. However, it is recognized that on some in-house projects that may include very large numbers of matrixed employees, this could become burdensome. In these cases, the project should provide performance feedback for product design leads, and/or subsystem leads, at least once per year. In turn, these product design leads, and/or

subsystem leads, should be providing performance feedback on the members of the teams that they lead, back to the branch. This action must be done twice per year at a minimum, but again quarterly is recommended.

The project must respond to the request for information on the matrixed employee's performance appraisal quarterly and/or semi-annually in a timely fashion. Because the project is providing day-to-day direction, mentoring, etc., for co-located matrixed employees, it is responsible for providing feedback to the home supervisor anytime there is a special need to do so. This can be for outstanding performance on a particular task, or because of workload, overall performance, or any other issue for which the home organization should be made aware. If a project wishes to raise an issue about the poor performance or conduct of a matrixed employee, this complaint should be provided to the home supervisor as soon as poor performance is observed. The initial contact may be a phone call from the project manager to the branch manager with a follow-up meeting in person if necessary. If the complaint persists, the project should promptly document the complaint in writing and provide it to the home organization in a timely manner. Poor performance and/or customer complaints should be addressed immediately or as soon as feasible by both the project and branch head. For co-located matrixed employees, the project should have some written input to the matrixed employee's performance plan for the year.

The matrixed employee also has responsibilities in the performance planning/appraisal process. In planning, he/she should discuss the work for the year with the project as well as with the home supervisor. During the performance appraisal review, he/she needs to provide both the project and the home supervisor his or her self-assessment (including accomplishments and areas for improvement) on the work performed throughout the year. This will be considered by both parties in their evaluation of the employee's performance.

A face-to-face meeting between the matrixed employee, the home supervisor, and the project manager (or subsystem lead), per performance period (year), is desirable to discuss the employee's performance. This might not be practical, however, considering the large size of many projects. The recommendation is that these should be held as necessary rather than on a schedule. A separate meeting between the matrixed employee and the home supervisor is recommended to cover issues not related to the project. Additionally, the project manager or subsystem lead should be provided a copy of the matrixed employee's performance plan and appraisal if so requested.

The functional organization is also responsible for supplying support service contractors to the project if necessary. These contractors are critical members of the project team. Thus, the project is also responsible for providing performance feedback to the home organization on contractor support. This will also allow the functional organization to evaluate contractor performance. The same basic guidelines apply for the support service contractor feedback as for the civil service feedback, except it need not be in the GSFC format, or as frequent. Two times per year is sufficient.

GENERAL RULE: The home supervisor is responsible for the process to evaluate the matrixed employee's performance. This includes collecting performance information through quarterly meetings with the project. The project is responsible for a timely response in this process,

including prompt written input to the supervisor if poor performance or misconduct is perceived, and the home organization is responsible for responding appropriately and immediately to this information. The matrixed employee should provide self-assessments to the home supervisor. Two face-to-face meetings per year between the project manager, home supervisor, and matrixed employee are recommended. In-house projects with very large numbers of matrixed employees may work this process through the product design and/or subsystem leads. It is also very important for subsystem or product design leads to provide performance feedback on contractors that are supporting their efforts.

3.7 Employee Recognition and Awards

Both the project and the home organization have responsibilities for the awards and recognition that the matrixed employee receives outside the performance appraisal process. The project observes the co-located matrixed employee on a day-to-day basis and, therefore, can observe the performance frequently and directly. For project specific awards, i.e., from the project, the project can and should act directly, evaluate the matrixed employee along with others on the project, and provide the award and recognition. For more general awards (Centerwide), and/or specific home organization awards, e.g., peer awards, the home organization has the responsibility to follow through with the project on obtaining content/detail for the award nomination. This, however, does not preclude the project from directly submitting higher level (Center, NASA) award nominations if they choose to do so. The project and functional organizations should coordinate matrixed employee award nominations to minimize the submission of duplicate awards for the same matrixed employee.

Because of the proximity of employees who are not co-located but remain with the home organization, there might be a tendency to recognize these employees more readily than a co-located matrixed employee who is often out of sight. Thus, it is important for the home organization to consciously solicit and observe the performance of all branch employees to ensure that all employees are considered equally for awards and recognition. This is one of the primary reasons for the high level of communication recommended in Section 3.4.

GENERAL RULE: Project-related awards are submitted by the project. Center and NASA awards should be submitted by the home organization with input from the project, peers, and/or customers. The project may also submit Center and NASA award nominations directly if they choose to do so. The home organization supervisors must ensure that all employees are considered for awards. The project and functional organizations should coordinate matrixed employee award nominations to minimize the submission of duplicate nominations for the same matrixed employee.

3.8 Providing Independent Engineering Analysis and Review

A long-standing and respected feature of the GSFC matrix organizational structure, culture and its safety and mission success processes, is a robust system of checks and balances through independent review and assessment. Experience has demonstrated that alternative technical views, rigorous engineering analysis, and independent review are necessary to assure safety and mission success in flight programs. This feature has become an even more prominent subject in the Agency following the Columbia accident. "Independent" means that someone other than the person responsible for the original design conducts a review or performs a check on the analysis of a component, subsystem, system, etc. This section considers this independent function from the view of the matrixed employee.

In general, a matrixed employee working on a project, or his/her supervisor, cannot be an independent reviewer of that project because he/she is directly responsible for the design of the product. The leadership of the supporting organizations for a project, i.e., the home branches, has the responsibility to ensure the quality and accuracy of the organization's engineering products. They perform this function through many avenues, for example, through frequent meetings with the matrixed employee on project progress, holding monthly technical reviews with the matrixed employee reporting on project progress, MBWA, etc. This type of organizational support also provides the matrixed employee the full backing of his/her home organization in his/her support of the project and assures the integrity of delivered products.

GSFC has the advantage of a large number of active projects and a strong, competent engineering workforce. Employees from one project can serve as independent reviewers on another project. This ensures that project teams benefit from independent confirmation of the adequacy of approach, alternative ideas, and experience. It also promotes individual and organizational learning. Engineering Peer Reviews and Integrated Independent Reviews are conducted per GPR 8700.6 and GPR 8700.4, respectively. Employees may also be called upon to assess a colleague's engineering products such as plans, analyses, and reports, or participate in formal anomaly review teams or mishap boards. Independent review and assessment activities should be independently funded as an additional measure of independence. These activities are charged to a separate WBS set up for each project through the Mission Success service pool.

Rapid and accurate communication with all parties can be critical in situations that might risk safety and mission success. If a matrixed employee observes an issue on the project that he or she thinks could endanger safety and mission success, that person has the **absolute and unconditional** obligation to bring that issue to the attention of the project manager, mission system engineer, and to the home organization. If the project manager chooses not to listen or act, the home organization should first discuss it with the project manager, and then, if not resolved satisfactorily, it has an **absolute and unconditional obligation** to raise it to a higher level within the Division, Directorate, or Center until a satisfactory resolution is achieved. Informing the project manager first is important because he/she has the ultimate responsibility for safety and mission success, and should not be surprised by an issue coming from the home organization without first having heard it from the matrixed employee working on the project.

The matrixed employee should apprise the home organization of the issue soon after informing the project, in either case, i.e., whether or not the project manager agrees with the concern. If the issue turns out not to be critical to safety and mission success, nothing is lost in this process. In addition, if it is not critical to safety and mission success, the matrixed employee needs to understand the project manager often has to make decisions based on less-than-perfect technical designs or data, but ones that impact other concerns such as cost and schedule. If an employee perceives that he/she will experience retribution for asserting a message regarding safety and mission success, the employee should consult with their home organization supervisor before communicating with project management. There can be no retribution given to an employee for raising these concerns.

The Mission System Engineer (MSE) is generally the most senior AETD representative on a project and bears a special responsibility based on his/her role as MSE. The MSE should be the technical conscience of the project and an unwavering advocate for safety and mission success issues. Other matrix employees should view the MSE as an advocate.

GENERAL RULE: If a matrixed employee observes an issue on the project that he or she thinks could endanger safety and mission success, that person has the absolute and unconditional obligation to bring that issue to the attention of the project manager, mission system engineer, and to the home organization. If the project manager chooses not to listen or act, the home organization should first discuss it with the project manager, and then, if not resolved satisfactorily, has an absolute and unconditional obligation to raise it to a higher level within the Division, Directorate, or Center until a satisfactory resolution is achieved.

3.9 Annual/Sick Leave, Tele-work and Overtime

This section describes the communication and coordination of leave and work hours between the home and project organizations. It is important for the project manager, the functional supervisor, and the matrixed employee to understand NASA and GSFC leave and compensation policy. Official GSFC policy is available at the following Web site: http://ohr.gsfc.nasa.gov.

3.9.1 Scheduling leave

The matrixed employee should inform both the project organization and the home organization when scheduling annual leave or sick leave (when sick leave is known in advance, such as for a medical treatment or surgery). The matrixed employee should inform the project and the home organization secretary/supervisor when using sick leave without advance notice.

The matrixed employee must coordinate his/her leave schedule with the project organization such that his/her leave schedule minimizes the impact to the mission development schedule. The project and the home organization must coordinate the backfill of a matrixed employee who must take leave during critical mission development periods. It is important to note that the home supervisor, due to project schedule constraints, may reject requests for annual leave. These special circumstances should be discussed and coordinated by the home organization, the project organization, and the matrixed employee.

The matrixed employee must provide adequate notice to both the project and home organization when requesting annual leave. A guideline commonly used at the GSFC is to provide 8 hours of notice for every 8 hours of annual leave requested (e.g., when an employee requests 40 hours of annual leave they should request it at least one week in advance). Projects may request vacation schedules or annual leave schedules from project personnel at the beginning of a fiscal year so that the project can manage critical work periods appropriately.

3.9.2 Work/Travel Schedules and Telecommuting

Matrixed employee work schedules and Tele-work Agreements must be coordinated with, and receive approval from both the home and project organizations. The primary objective for both the home and the project organizations is to accomplish the mission, and, therefore, the project primarily influences the work schedules of matrixed employees and the content of Tele-work Agreements. The functional manager must ensure that the matrixed employee adheres to the agreed upon work schedule and approved Tele-work Agreement. In addition, the functional manager must ensure that the Tele-work Agreement is current or produce a new one if the current agreement is expired or about to expire. Lastly, the matrixed employee should inform both the project and the home organization of his/her training and travel schedules.

3.9.3 Working Overtime

Projects may request that matrixed employees work overtime or compensatory time (comp-time) to meet project milestones. All overtime and/or compensatory time should be approved by the project before the overtime and/or comp-time is worked. The project should also inform the home organization that the project approves of the additional work hours, overtime, or compensatory time. The matrixed employee should inform the home organization about the additional work time accumulated via e-mail or written notice containing the dates of overtime/comp-time worked and the number of hours accumulated so that the appropriate memos are provided to the payroll organization. This notification should be provide at or before the timecard due date. Official NASA or the Office of Management and Budget (OMB) policy determines the pay rates for overtime, comp-time, and holiday pay. Additional information is available at the link provided at the beginning of this section.

GENERAL RULE: The matrixed employee must coordinate his/her leave schedule with the project organization such that his/her leave schedule minimizes any impact to the mission development schedule. The matrixed employee must provide adequate notice to both the project and home organization when requesting annual leave. A guideline commonly used at GSFC is to provide 8 hours of notice for every 8 hours of annual leave requested. The matrixed employee should inform the home organization about additional overtime or comp-time time accumulated via e-mail or written notice containing the dates of overtime/comp-time worked and the number of hours accumulated. This notification should be provide at or before, the timecard due date. The matrixed employee should inform both the project and the home organization of his/her training and travel schedules.